

CLAIMS

1. A polyacetal mixture for processing into a polyacetal article to be acid-etched and plated comprising:
  - a polyacetal resin blend comprising 97 – 99.9wt% polyacetal and 0.1 – 3wt% of semicrystalline or amorphous thermoplastic non-polyacetal resin of molecular weight 5,000 – 50,000; and
  - acid-soluble particles from the group selected from at least one salt of at least one metal from Group II of the periodic table of elements, said acid-soluble particles being present in an amount from 2 to 6% by weight of the polyacetal blend, at least 98% of said acid-soluble particles being in the size range from 0.1 to 5 micrometers.
2. The polyacetal mixture of claim 1, wherein the polyacetal blend comprises 98 – 99.5wt% polyacetal and 0.5 – 2wt% of the semicrystalline or amorphous thermoplastic non-polyacetal resin.
3. The polyacetal mixture of claim 2, wherein the semicrystalline or amorphous thermoplastic non-polyacetal resin comprises at least one nitrogen containing organic material.
4. The polyacetal mixture of any preceding claim, wherein said acid-soluble particles are present in an amount from 3 to 5% by weight of the polyacetal blend, at least 98% of said acid-soluble particles being in the size range from 0.1 to 2 micrometers.
5. The polyacetal mixture of claim 1, wherein the acid-soluble particles are made of calcium carbonate.
6. The polyacetal mixture of claim 1, wherein the polyacetal mixture further comprises acid-insoluble inorganic particles from the group consisting of glass powder, kaolin and silicates, said acid-insoluble particles being present in an amount from 1/5 to 1/50 the weight of the acid-soluble particles, the average primary particle size of the acid-insoluble particles being from 1/20 to 1/100 the size of the acid-soluble particles.
7. The polyacetal mixture of claim 6, wherein the acid-soluble particles are present in an amount from 3% to 5% by weight, and the acid-insoluble particles are present in an amount from 0.1% to 0.5%, both by weight of the polyacetal blend.

8. The polyacetal mixture of any preceding claim, wherein the acid-insoluble particles are fumed silica.

9. The polyacetal mixture of any preceding claim, wherein the acid-insoluble particles are in the size range from 5 to 40 nanometer.

5 10. A polyacetal article to be acid etched and plated, produced from a polyacetal mixture according to any preceding claim, the polyacetal article comprising at its surface said acid-soluble particles in the polyacetal blend.

10 11. The polyacetal article of claim 10, which further comprises acid-insoluble particles smaller than the acid-soluble particles, the acid-insoluble particles being anchored in the polyacetal blend around the surfaces of the acid-insoluble particles.

15 12. An acid-etched polyacetal article obtainable by acid etching of the polyacetal article of claim 11 to remove the acid-soluble particles, leaving the acid-insoluble particles anchored in the polyacetal blend around open pores left by the removal of the acid-soluble particles.

13. A plated polyacetal article obtainable by plating the acid-etched polyacetal article of claim 12 with at least one of: a plating catalyst, an electroless metal plate and a galvanoplate.

20 14. A method of electroplating a polyacetal article, which comprises:  
- producing from the mixture as claimed in any one of claims 1 to 8 a polyacetal article wherein the acid-soluble particles are present at the article surface,  
- acid etching the polyacetal article to remove the acid-soluble particles,  
25 - applying a plating catalyst to the etched surface,  
- applying an electroless metal plating,  
- applying a galvanoplate.

30 15. The method of claim 14, wherein the polyacetal mixture further comprises acid-insoluble inorganic particles from the group consisting of glass powder, kaolin and silicates, said acid-insoluble particles being present in an amount for 1/5 to 1/50 the weight of the acid-soluble particles, the average primary particle size of the acid-insoluble particles being from 1/20 to 1/100 the

size of the acid-soluble particles, and wherein said acid-insoluble particles are present on the surfaces of pores in the etched polyacetal article formed by removal of the acid-removable particles.

16. The method of claim 14 or 15, wherein the polyacetal article is  
5 etched in a mixed acid bath containing at least three acids selected from sulfuric acid, phosphoric acid, hydrochloric acid and acetic acid, in particular containing all four said acids.

17. The method of claim 14, 15 or 16, wherein the polyacetal article is provided by molding, extrusion or thermoforming.

10 18. A method of preparing the polyacetal mixture of claim 6, the method comprising:

- preparing a polyacetal blend by blending a polyacetal resin with semicrystalline or amorphous thermoplastic non-polyacetal resin of molecular weight 5,000 – 50,000, in the amounts 97 – 99.9wt% of the polyacetal resin  
15 and 0.1 – 3wt% of the non-polyacetal resin;
- preparing a mixture of acid-soluble particles and acid-insoluble particles, the acid-soluble particles being selected from at least one salt of at least one metal from Group II of the periodic table of elements, the acid-insoluble particles being selected from the group consisting of glass powder,  
20 kaolin and silicates, at least 98% of said acid-soluble particles being in the size range from 0.1 to 5 micrometers, said acid-insoluble particles being present in an amount from 1/5 to 1/50 the weight of the acid-soluble particles, the size of the acid-insoluble particles being from 1/20 to 1/100 the size of the acid-soluble particles; and
- 25 - mixing said mixture of particles into the polyacetal blend wherein said acid-soluble particles are present in an amount from 2 to 6% by weight of the polyacetal blend.